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**DEVELOPING AND USING PROFILES:  
A PRIMER FOR PSRO PHYSICIANS**

October 19, 1978

**U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE**

**HEALTH CARE FINANCING ADMINISTRATION  
HEALTH STANDARDS AND QUALITY BUREAU**

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# MEMORANDUM

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
HEALTH CARE FINANCING ADMINISTRATION  
HEALTH STANDARDS AND QUALITY BUREAU  
OFFICE OF PROFESSIONAL STANDARDS REVIEW ORGANIZATIONS

TO : Planning and Conditional PSROs;  
Statewide Councils; Regional  
PSRO Project Officers

DATE: OCT 19 1978

TECHNICAL ASSISTANCE  
DOCUMENT NO. 17

FROM : Director

SUBJECT: "Developing and Using Profiles; A Primer for PSRO Physicians"

"Developing and Using Profiles; A Primer for PSRO Physicians" was developed by InterQual, Inc., under their expert assistance contract (No. 240760106) with the Health Standards and Quality Bureau (HSQB). It is intended to assist PSROs in their efforts to provide PSRO physicians with an understanding of the concept of profiles and profile analysis.

Section 1155(a)(4) states that each PSRO "shall be responsible for arranging for the maintenance of and the regular review of profiles of care and service received and provided with respect to patients... Profiles shall also be regularly reviewed on an ongoing basis with respect to each health care practitioner and provider to determine whether the care and services ordered or rendered are consistent with criteria specified..." in other sections of the law. Section 101.711 of the proposed rules on "Procedures for Review of Hospital Services" reiterates the requirement that PSROs perform profile analysis on the health care provided to Federal patients by health care practitioners and providers.

While PSROs are aware of the charge that they develop profiles and utilize profile analysis as part of their review activities, they often experience difficulty in explaining profiles and profile analysis to PSRO physicians and staff who are not familiar with these concepts. It is for this reason that we requested InterQual, Inc., to develop this primer. It is designed to make available to PSROs documentation which can help them provide PSRO physicians and staff with a working knowledge of profiles and profile analysis. It is intended that this knowledge will enable the PSRO physicians to utilize the results

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PSRO Reference: Transmittal Number 61

PSRO Program Manual Chapter: \_\_\_\_\_

PSRO Technical Assistance Document No: \_\_\_\_\_

of the PSRO's profiling efforts to set meaningful objectives for the PSRO. Understanding profiles and profile analysis should also enable PSRO physicians to analyze the impact of PSRO review activities on the quality of care and utilization of services in the PSRO area.

We believe that PSROs will find this primer useful. Please direct any comments or questions to your Regional Project Officer.

A handwritten signature in dark ink, appearing to read "Michael J. Goran". The signature is fluid and cursive, with the first name "Michael" and last name "Goran" clearly distinguishable.

Michael J. Goran, M.D.

Attachment

# DEVELOPING AND USING PROFILES

## A PRIMER

### FOR

## PSRO PHYSICIANS

Developed by Martin L. Waldman, M.D., Director of Research and Development InterQual, Incorporated, 740 N. Rush St., Chicago, Illinois, 60611. This work was performed pursuant to DHEW Contract No. 240-76-0160, for the Office of Professional Standards Review, Health Standards and Quality Bureau, Health Care Financing Administration.

## A PROFILE IS SIMPLY AN OVERVIEW

WEBSTER SAYS

THE SKYLINE IS A PROFILE  
OF THE CITY

'profile' \ˈprɒ-faɪl\ n [It *profilo*, fr. *profilare* to draw in outline, fr. *pro-* forward (fr. *l.*) + *filare* to spin, fr. *LL.* — more at *FILE*] 1 : a representation of something in outline; *esp.* a human head or face represented or seen in a side view 2 : an outline seen or represented in sharp relief : *CONTOUR* 3 : a side or sectional elevation; as *a* : a drawing showing a vertical section of the ground *b* : a vertical section of a soil exposing its various zones or inclusions 4 : a set of data often in graphic form portraying the significant features of something <a corporation's earnings ~>; *esp.* : a graph representing the extent to which an individual exhibits traits or abilities as determined by tests or ratings 5 : a concise biographical sketch *syn* see *OUTLINE*  
'profile' w. *pro-* filed; *pro-* filing 1 : to represent in profile or by a profile : produce (as by drawing, writing, or graphing) a profile of 2 : to shape the outline of by passing a cutter around —



## BALANCING A CHECKBOOK — THE COMPARISON OF TWO PROFILES

PLEASE BE SURE TO <u>RECORD</u> ANY FEE/CHRG. CHARGES OR SERVICE CHARGES THAT MAY APPLY TO YOUR ACCOUNT		DATE		CHECK NO.		AMOUNT OF CHECK		DATE		CHECK NO.		AMOUNT OF DEPOSIT		BALANCE	
CHECK NO.	DATE	CHECK NO.	DATE	CHECK NO.	DATE	CHECK NO.	DATE	CHECK NO.	DATE	CHECK NO.	DATE	CHECK NO.	DATE	CHECK NO.	DATE
1156	10/2	Seaside Company		240	00									2,143	00
1157	10/3	Cherry Hill		205	00			515	00			2,013	00		
1158	10/5	Central Light & Power		115	00			295	00			1,903	00		
1159	10/6	Western Telephone		310	00							1,823	00		
1160	10/2	Jana A. Building Mgt.		190	00			425	00						

Seaside Company 10 East 1st Street		Statement of account with THE SECURITY BANK	
Due	Checks and Other Debits	Deposits	Balance
Oct. 1	Balance brought forward		2,143.00
2	240.00	315.00	1,903.00
3	205.00		2,013.00
5	175.00	295.00	2,133.00
6	310.00		1,823.00
12	195.00	425.00	2,058.00
15	135.00	235.00	1,903.00
22	260.00	535.00	2,178.00
28	210.00	115.00	1,903.00
30		530.00	2,353.00
31	115.00 NSF 5.00 SC	399.00 CM	2,637.00
Code: CM Credit memorandum NSF Not sufficient funds check DM Debit Memorandum SC Service charge			

The various stockmarket indexes (Dow-Jones, Standard and Poors, etc.) provide A PROFILE OF THE ECONOMY. A PSRO profile provides an overview of the information collected about medical care delivered within a PSRO area.

## PSRO PROFILES CAN BE USED TO

- ESTABLISH REVIEW PRIORITIES FOR MCE
  - by identifying both problem areas and areas of strength and good performance
- FOCUS CONCURRENT REVIEW
  - by identifying those areas where 100% concurrent review is no longer needed (focus out)
  - by indicating areas where review should be intensified (focus in)
- MONITOR PERFORMANCE
  - by periodic profiling of key indicators where previously identified deficiencies have been corrected
- SURVEY CARE OF ALL COVERED PATIENTS
  - by periodic examination of key outcome indicators
- DEMONSTRATE IMPACT OF REVIEW
  - by displaying the changes that have occurred
- EXAMINE OTHER ISSUES
  - i.e., issues not related to review but which can affect the functioning of the PSRO such as characteristics of the community population, reliability of data collection, etc.

## ADVANTAGES OF PROFILES

- PROVIDE BROAD PROSPECTIVE

By using aggregated data, profiles can indicate problem areas that are not visible when reviewing care on a record by record basis, i.e., while the care of each patient may seem appropriate, the care when viewed as a conglomerate and compared to other referents seems to be out of line.

- ACCOUNT FOR EXPECTED VARIATION

By displaying a *range* of values (spread) for a patient group, profiles can be used to evaluate whether the expected (desired) spread exists. For example, the shortest and the longest length of stay, or the most frequent and least frequent procedures.

- SHOW TRENDS

Profiles that display the same measurements over time allow for analysis of trends that can help predict whether the current status is being maintained, slipping, or starting to improve.

- FORM OBJECTIVE BASIS FOR DECISION MAKING

Based on objective observable features of patients/providers/institutions, profiles can be used to document and support the basis for corrective action, thus removing any hint of partiality or capriciousness.



## LIMITATIONS OF PROFILES

The use of aggregated data describing groups of patients (thus concealing the identity and characteristics of the individual patient) imposes certain limitations that must be recognized if appropriate analysis is to be made. These limitations include:

- Only comparative measurements are displayed - absolute judgments can *not* be made.
- Patterns are displayed, not specifics - conclusions can *not* be drawn about care of an individual patient.
- A profile as an overview requires analysis and interpretation - the raw data can often be misleading.

## LOCAL ANALYSIS OF PROFILES

The limitations of PSRO profiles can be overcome - and profiles used to their fullest advantage - if analysis takes place as close as possible to the "point of service", that is, in the place where care is provided. Though profiles may be generated at a distance, valid analysis, including developing additional information and providing explanations, can best be done by those who understand how local factors influence the data portrayed in the profile.

For example, an apparent abuse of acute care beds for Medicare patients with hip fractures could be due to a shortage of ECF beds in the area - but only someone with an understanding of *local* problems could offer that explanation.

## THE COMPUTER AND PSRO PROFILE ANALYSIS

Many PSROs have not yet involved themselves in profile analysis because of a belief that this type of review is dependent on having a completely "debugged" computer system before profiles can be produced.

While it is true that a computer is useful in storing large quantities of data, sorting the data in multiple ways, and making multiple and highly sophisticated correlations, this may not always be immediately available. Since one of the basic characteristics of a useful profile is its simplicity, a reasonable approach is to design an initially simple profile (by excerpting existing data) that can be produced manually. If, after testing the usefulness of the design through analysis, it is decided to use that format in an on-going monitoring situation or to apply it to multiple groups, then it may become worthwhile to incorporate that into the design of the computerized data system.

All of the computerized discharge abstract systems, some government agencies, and many of the fiscal intermediaries already have "canned" programs that produce displays resembling profiles. But all too often these displays are lengthy, crowded, and so complex that it takes an expert to excerpt them before they become useful -- for otherwise an "information overload" occurs leading to confusion and misinterpretation. Such displays are best used as sources of data from which a member of the PSRO staff (who is knowledgeable in the organization and contents of the print-out) excerpts the pertinent data and displays it in a simple format, producing where necessary, multiple simple profiles, rather than a complex, confusing concatenation of cascaded columns.

## CONFIDENTIALITY AND PSRO PROFILES

The issue of confidentiality has been raised as a barrier to producing PSRO profiles. The real issue is not whether those to whom data is trusted will give it away (break the confidentiality), but rather, what "security" is provided so that data will not fall into the hands of those who are not authorized to see it.

The physician, in treating his patients, acquires information that he can *not* be forced to reveal. The medical record in the hospital is kept secured (in the medical record department) and only those with proper authorization are allowed access to it.

Data abstracted from the record for PSRO purposes, is kept secured in a number of different ways. First of all, regulations specify what data is to be abstracted and what portion of that data may be forwarded to other users, thus limiting the danger of theft and misuse. For example, patient and physician identifiers are collected and retained at the PSRO - they are *not* transmitted to HSQB or DHEW.

Secondly, through the aggregation of data for profiles, the details of the case history of an *individual* patient become invisible. Since aggregated data displays only patterns, no inference can validly be drawn about the care given to one patient nor can such data validly be applied as a standard to any individual case. Computerized data is further guarded in ways designed to limit access to those who need to know. Many data processing organizations require security oaths of their employees and have contractual agreements with their clients concerning what data may be released, to whom, and under what circumstances.

Access is further limited by the use of protective computer programming so that only those who are so authorized can retrieve information. Additional protection is provided through the use of confidential code numbers to record patient and provider identity, with the translation lists remaining at the local level. The PSRO should assure itself that such security precautions are taken by whoever handles data from their area.

The other side of the issue of confidentiality is a matter of protection provided by policy. As mentioned before, HSQB policies keep patient and physician identities sequestered at the PSRO level, thus ensuring the confidentiality of data down to that level. The aggregated data displayed in profiles is by policy available to the federal government. Since the data is thus available, the best protection against improper use of the data lies in local interpretation rather than transmittal of raw data to be interpreted in a vacuum. That is, the analysis of the meaning of such data should be carried out by those who are familiar with local factors that may explain apparent deviations from expected practices.

## THE ANATOMY OF A PSRO PROFILE

### A USEFUL PSRO PROFILE

- IS SIMPLE

Relationships and differences are much clearer if a profile is concerned with only one thing at a time. Multiple profiles each displaying only one data item at a time are easier to analyze than a complex profile with many entries.

- HAS A DEFINED PURPOSE

Defining the purpose leads to logical design. Creating a profile with no purpose in mind is a waste of time and energy (both yours and others) and can lead only to confusion and misinterpretation.

- DISPLAYS AGGREGATED DATA

Aggregating data discloses patterns of care that cannot be perceived when looking at one case at a time, thus revealing problems that may otherwise remain hidden.

- PROVIDES REFERENCE POINTS

Reference points provide the basis for comparison that is essential in analyzing a profile. Descriptions of performance alone are meaningless without something against which they can be evaluated.

- YIELDS NEW INFORMATION

The comparison of performance patterns and reference points reveal differences and similarities from which inferences may be drawn and predictions made. These findings and conclusions form the basis for decisions regarding additional activity.

- LEADS TO RECOMMENDATIONS

Recommendations for further activity which may include gathering of additional information, modifying review plans, instituting corrective action, etc., can thus be based on and supported by objective information - intuition isn't good enough anymore.

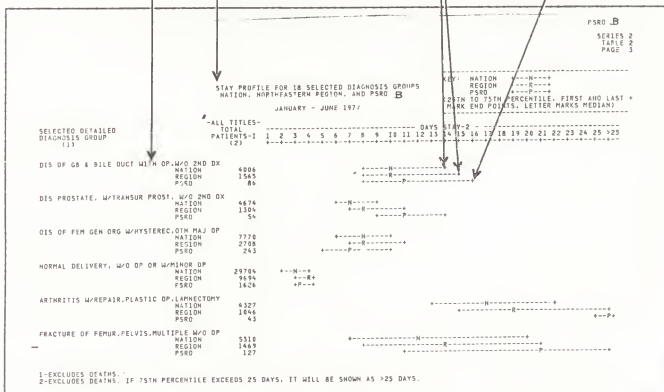
# THE COMPONENTS OF A PSRO PROFILE

THE GROUP of patients covered by the profile

SUB-GROUPS into which the group is divided

MEASUREMENTS of current comparison

REFERENCE POINTS for comparison



## TYPES OF PSRO PROFILES

The type of PSRO profile is determined by how the GROUP is selected, the SUB-GROUPS follow therefrom:

TYPE OF PROFILE	GROUP	SUB-GROUPS
Patient	All patients in the PSRO area defined by patient characteristics such as diagnosis/problem/condition, type of therapy, age group, etc. or tracking individual patients, if the review system includes hospital, ambulatory and long term care settings.	By Hospital By Clinical Service By Provider, etc.
Provider	All patients in the PSRO defined by who provided the service such as patients of Dr. X, patients under care of anesthesia group, patients whose x-rays were read by Dr. Y., etc.	By Diagnosis/ Problem/ Condition By Type of Therapy By Age Group By Hospital
Institution	Patients treated in one hospital or in an internal division of a hospital (service, special care unit, etc.)	By Provider By Diagnosis By Type of Therapy By Age Group, etc.

## THE GROUP

A clear definition of the group of patients included in a profile will contain:

1. The characteristic on which the patients are selected

e.g., diagnosis of acute myocardial infarction, patients undergoing cholecystectomy, patients treated in Hospital A, patients treated by Dr. X, etc.

2. The universe from which the group was selected

e.g., all federally financed patients in PSRO Area X.

3. The time period covered

e.g., patients discharged during Jan-March 1977.

### GROUP

1. CHARACTERISTIC
2. UNIVERSE
3. TIME PERIOD

STAY PROFILE FOR 18 SELECTED DIAGNOSIS GROUPS  
NATION, NORTHEASTERN REGION, AND PSRO **B**  
JANUARY - JUNE 1977

SELECTED DETAILED DIAGNOSIS GROUP (1)	-ALL TITLES- TOTAL PATIENTS-1 (2)		DAYS STAY-2														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
DIS OF GB & BILE DUCT WITH OP, W/O 2ND DX	NATION	4006															
	REGION	1565															
	PSRO	86															
DIS PROSTATE, W/TRANSUR PROST, W/O 2ND DX	NATION	4674															
	REGION	1304															
	PSRO	54															
DIS OF FEM GEN ORG W/HYSTEREC, OTH MAJ OP	NATION	7770															
	REGION	2708															
	PSRO	243															
NORMAL DELIVERY, W/O OP OR W/MINOR OP	NATION	29704															
	REGION	9694															
	PSRO	1626															



## SUB-GROUPS

The GROUP is divided into SUB-GROUPS so that performance may be compared.

The display may clearly indicate:

1. The characteristic used to establish the SUB-GROUPS

e.g., by hospital, by provider, by diagnosis,  
by age group, etc.

**NOTE:** SUB-GROUPS must be chosen so that *every*  
patient in the group fits into one and  
only one SUB-GROUP.

2. The factor that determines the order in which the  
SUB-GROUPS are listed (since this may be very sig-  
nificant)

e.g., ranked by size, ranked by performance,  
listed in diagnosis code number order, etc.

### GROUP

1. CHARACTERISTIC
2. UNIVERSE
3. TIME PERIOD

### SUB-GROUPS

1. By Diagnosis  
Group
2. Numeric  
Order  
Diagnosis  
Code

STAY PROFILE FOR 18 SELECTED DIAGNOSIS GROUPS NATION, NORTHEASTERN REGION, AND PSRO B		JANUARY - JUNE 1971																
SELECTED DETAILED DIAGNOSIS GROUP (1)	-ALL TITLES- TOTAL PATIENTS-1 (2)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
DIS OF PB & BILE DUCT WITH DP, W/D 2ND DX	4086																	
NATION	1565																	
REGION	86																	
PSRO																		
DIS PROSTATE, W/TRANSUR PROST, W/D 2ND DX	4674																	
NATION	1384																	
REGION	94																	
PSRO																		
DIS OF FEM GEN ORG W/HYSTERE, DTH MAJ DP	7770																	
NATION	2788																	
REGION	243																	
PSRO																		
NORMAL DELIVERY, W/D DP OR W/MINOR OP	29704																	
NATION	9494																	
REGION	1626																	
PSRO																		
ARTHRITIS W/REPAIR, PLASTIC OP, LAMINECTOMY	4327																	
NATION	1846																	
REGION	43																	
PSRO																		
FRACTURE OF FEMUR, PELVIS, MULTIPLE W/D OP	5318																	
NATION	1469																	
REGION	127																	
PSRO																		

## THE MEASUREMENTS

A measurement consists of

- an ELEMENT - the thing being measured e.g.,  
LOS, incidence of occurrence,  
presence of variation from  
criteria, age, etc.
- plus -
- one or more UNITS - of measurement such as total  
number, percentages, averages  
percentiles, etc.
- plus -
- the VALUE(S) - for the GROUP, each SUB-GROUP  
and each REFERENCE POINT ex-  
pressed in terms of the units

To understand the significance of a measurement, it is helpful to dissect it into its component parts. In the example profile on the facing page, there are two different measurements displayed:

### SIZE of the SUB-GROUPS

ELEMENT: Patients in selected detailed diagnosis group

UNIT: Total number of such patients

VALUES: Displayed as numbers for each diagnosis group

EXAMPLE: *The PSRO had 86 patients with diseases of the gall bladder and bile duct during January - June 1977, the region had 1565, and the nation had 4006.*

### STAY PATTERN

ELEMENT: Days of stay displayed as a graphic scale across the page

UNIT: 3 units are used; the 25th percentile, the 50th percentile, and the 75th percentile.

VALUES: Graphically displayed as points along the scale for the PSRO, the region and the nation (see key in upper right-hand corner)

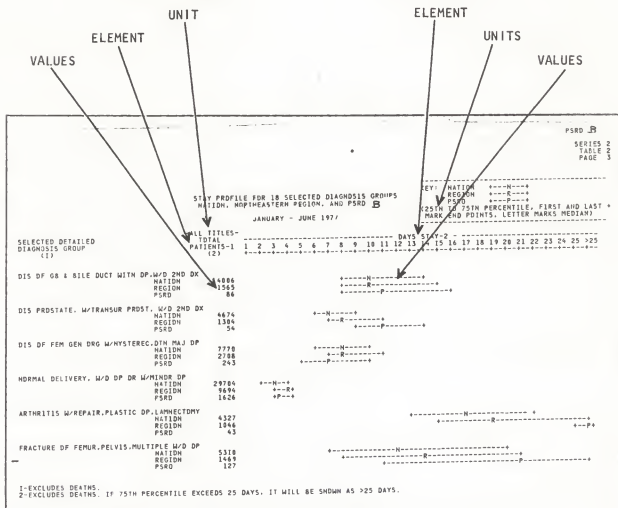
EXAMPLE:

DISEASES OF GALL BLADDER  
AND BILE DUCT

25th percentile	8	8	8
50th percentile	11	10	10
75th percentile	16	15	14

SIZE OF GROUP  
and SUB-GROUPS

STAY PATTERN



## WHAT IS BEING MEASURED?

Different units describe different characteristics of a group. Inferences and conclusions can only be appropriately drawn when there is a clear understanding of *what* is being measured - knowing that someone weighs 170 pounds does *not* tell how tall he is, nor does it tell whether he is "fat" or "skinny." Commonly used units are displayed below, along with an explanation of what characteristics each measure. Examples are given along with the profile on the facing page.

UNIT	CHARACTERISTIC
Total Number	Size of <i>group</i> and <i>sub-group</i>
Average (Mean)	An estimate of the central tendency of the values. It has the basic defect of being contaminated by outliers.
Standard Deviation (SD) and Coefficient of Variation	The standard deviation measures the absolute variation about the mean. The coefficient of variation is the standard deviation divided by the mean, which is a more relative measure and thus more useful in analyzing length-of-stay data. In a reasonably homogeneous grouping one might expect the coefficient of variation to be approximately .5. A lower value indicates a tighter stay distribution, and a higher value reflects less consensus on the appropriate length of stay and treatment pattern for the group of patients studied or less homogeneous in the group.
Percentiles	Statements of what value various proportions of the group have attained, e.g., the 10th percentile stay is that day on which 10% of the patients have been discharged. A percentile pattern is a description of the spread of the group from a starting point - usually the lowest value.
Median	The median is the 50th percentile, and is also an estimate of the central tendency of the group. A comparison of the average and the median will indicate how close the distribution approaches a normal one and in which direction it is skewed, i.e., shifted away from being symmetrical. The median overcomes the defect of contamination of the mean by the outliers.

UTILIZATION BY SEVENTEEN DETAILED DIAGNOSIS GROUPS  
JUNE 1977

SERIES 2  
TABLE 1

SELECTED DETAILED DIAGNOSIS GROUP (1)	TOTAL NO. OF DISCHARGES (2)	TOTAL DAYS (3)	DEATHS (4)	LONG STAY P15-1 (5)	ALL TITLE DISCHARGES		---AVERAGE STAY---		PERCENTILE STAY IN DAYS-4				
					P15-2 (6)	STAY (7)	STUDIED AVG. COEFF (8)	V05-5 (9)	10TH (10)	25TH (11)	50TH (12)	75TH (13)	90TH
DIABETES, AGE-35 W/O OP. W/O 2ND DX	154	1983	6	13	135	10.5	0.5	4	7	10	15	27	
NEUROSES, PERSONALITY DISORDERS	74	1362	0	1	73	17.6	0.7	4	8	16	24	37	
UIS OF EYE WITH EXTRACTION OF LENS	576	3782	2	23	551	5.8	0.4	4	5	5	7	10	
ACUTE MYOCARDIAL INFARCTION	588	10060	109	17	462	17.2	0.5	7	10	16	24	33	
ISCHEMIC HEART DIS. W/O OP. W/O 2ND DX	119	1155	1	8	110	7.8	0.6	3	5	8	10	20	
CEREB THROMBO-EMBOL W/O OP. W/O 2ND DX	101	1830	15	9	77	13.4	0.5	5	7	14	20	40	
HYPERTROPHY OF T & A	255	432	0	4	251	1.6	0.4	1	1	2	2	2	
ACUTE UPPER RESP. INF. & INFLU. AGE-44	29	295	0	1	28	9.6	0.7	3	4	7	13	24	
PNEUMONIA, AGE-31	210	1345	3	6	201	5.8	0.5	3	4	5	8	11	
PNEUMONIA, AGE-30 W/O OP. W/O 2ND DX	42	480	5	2	35	8.8	0.5	3	5	9	13	19	
GASTRIC & PEPTIC ULCER W/O OP. W/O 2ND DX	35	270	1	1	33	7.1	0.4	3	5	7	9	12	
HERNIA OF ABD CAV. AGE-64 W/MINOR REPAIR	252	2671	2	12	238	8.5	0.5	4	6	8	11	17	
DIS OF GB & BILE DUCT WITH OP. W/O 2ND DX	86	1146	0	6	80	11.9	0.4	7	8	11	16	23	
DIS PROSTATE, W/TRANSUR. PROST. W/O 2ND DX	54	621	0	0	54	11.5	0.4	6	9	11	14	16	
DIS OF FEM GEN ORG. W/HYSTERECL. OTM MAJ OP	244	2106	1	7	236	7.8	0.5	4	5	7	10	14	
NORMAL DELIVERY, W/O OP. OR W/MINOR OP	1424	3657	0	19	1407	3.4	0.3	3	3	3	4	5	
ARTHRITIS W/REPAIR, PLASTIC OP. LAMPECTOMY	43	1565	0	7	36	29.5	0.3	16	25	30	43	69	
* FRACTURE OF FEMUR, PELVIS, MULTIPLE W/O OP	132	3644	5	13	114	21.8	0.7	4	11	21	42	61	

1-LIVE DISCHARGES WITH UNUSUALLY LONG STAYS, WHO WOULD SKEW THE AVERAGE STAY. THE DEFINITION OF A LONG STAY IS DEPENDENT UPON THE PATIENT'S PRINCIPAL DIAGNOSIS.

2-EXCLUDES DEATHS AND LONG STAYS: COLS. 4 AND 5. THESE PATIENTS ARE ALSO EXCLUDED FROM COLS. 7 AND 8.

3-THE STANDARD DEVIATION DIVIDED BY THE AVERAGE STAY

\*-EXCLUDES DEATHS ONLY.

EXAMPLES (from excerpted profile above)

Total number	Column 2 - 154 patients with diabetes were discharged during Jan-June 1977.
Average	Column 7 - The average stay for diabetics was 10.5 days - note that this average is based on 135 patients (Col 6) - see footnotes to profile.
Coefficient Of Variation	Column 8 - The Coefficient of Variation for Hypertrophy of T&A (0.4) indicates a very small amount of dispersion, especially when compared to that for Neurosis Personality Disorders (0.7).
Percentiles	Columns 9 - Of the diabetics at least 10% will have been discharged by the 4th day, 25% or more by the 7th day, 50% or more by the 10th day, 75% or more by the 15th day, and 90% or more by the 25th day.
Median	Column 11 - The median for acute upper respiratory infection is 7 days - since the average stay is larger (Col 7-9.6 days) this means that the distribution is skewed to the right, i.e., toward longer stay. (Where the median is larger than the average as in Hypertrophy of T&A (see bottom line - Column 7-1.6, Col 11-2) the skew is to the left, i.e., toward shorter stay.

## WHAT DATA IS AVAILABLE FOR PSRO PROFILES?

Under federal programs two sets of data are collected on each patient.

They are: 1) The Uniform Hospital Discharge

Data Set (UHDDS)

2) PSRO Hospital Discharge

Data Set (PHDDS)

The Uniform Hospital Discharge Data Set (UHDDS) was developed by the National Center for Health Statistics in 1971. The purpose for the development of the UHDDS was to have a minimum set of data, uniformly defined, capable of providing basic and comparable information on all hospital discharges to all users.

Hospitals are encouraged to collect UHDDS data on all patients and are *required* to collect and report such data on all patients whose care is paid for under federal programs.

The UHDDS was initially identified as the minimum set of required information PSRO's would supply on each federal patient to the federal government. However, since information on the review process itself was lacking, a set of PSRO specific data elements were added (Part B) to provide this information.

The PHDDS therefore, has 2 parts:

PART A - UHDDS

PART B - DHEW/HSQB PSRO Specified Data Items

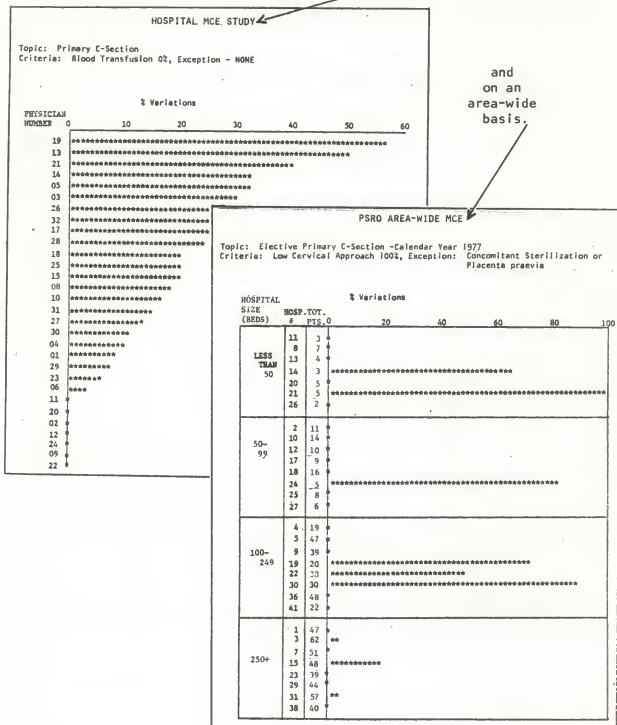
In those areas with functioning PSRO's, hospitals are required to collect and report the PHDDS for all patients whose care is paid for under federal programs. The PSRO in turn, is required to provide HSQB (formerly EQA) with data tapes containing the PHDDS on all federal patients in the PSRO area after having deleted physician and patient identifiers.

Many PSROs collect data elements other than PHDDS for local use. These data elements would also be available for profiles developed at the local level.

PSRO HOSPITAL DISCHARGE DATA SET (PHDDS)	
PART A Uniform Hospital Discharge Data Set (UHDDS)	PART B DHEW/HSQB PSRO Specified Data Items
1. Person Identification	15. Number of Days Certified at Admission
2. Date of Birth	16. Admission Certification Process and Outcome
3. Sex	17. Basis for Assignment of Initial Length-of-Stay
4. Race	18. Admission Certification Level of Review
5. Residence	19. Total Number of Days Certified
6. Hospital Identification	20. Total Number of Reviews Referred to Physician Review
7. Admission Date and Hour	21. Total Number of Extensions Approved
8. Discharge Date	22. Extension Denials
9. Attending Physician Identification	
10. Operating Physician Identification	
11. Diagnosis	
12. Procedures Performed	
13. Disposition of Patient	
14. Expected Principal Source of Payment	

\* NOTE: These data elements are collected and retained by the PSRO. They are not transmitted to HHS/OSRO.

In addition, much data has already been accumulated through performance of medical care evaluation studies in individual hospitals

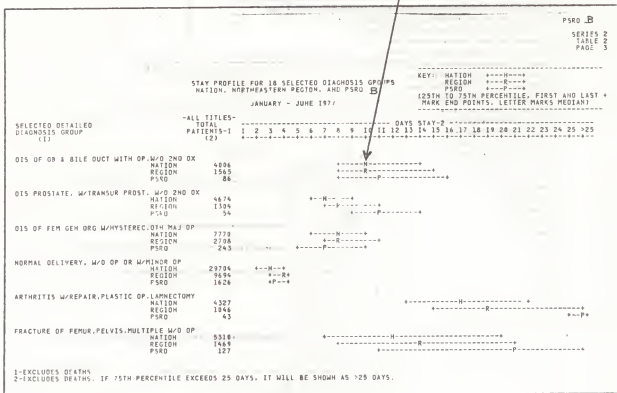


The issue of reliability of data will be discussed later.

## REFERENCE POINTS

REFERENCE POINTS are used as benchmarks for comparison to MEASUREMENTS of current performance. For such comparisons to be valid, REFERENCE POINT VALUES must be of the *same* ELEMENTS and in the *same* UNITS as the MEASUREMENTS.

- PUBLISHED NORMS - from national or regional data



- HISTORICAL DATA for comparisons over time would be obtained by generating this profile for a different time period.

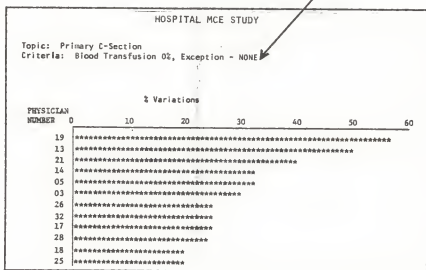


- GROUP VALUE - for comparison to SUB-GROUPS  
(or SUB-GROUP to SUB-GROUP)

AVERAGE PRE-OP STAT* FOR SELECTED PROCEDURES HOSPITAL DATA JANUARY 1977 - JUNE 1977												PSRC SERIES 3 TABLE 4 PAGE 1
AREA (1)	PROCEDURE**											
	CHOLE (2)	HEMOR (3)	INGUINO HERN (4)	MYST (5)	TRANS PROST (6)	SUPRA PROST (7)	T & A (8)	INTRA LENS EXTR (9)	RAD MASTEC (10)	ARTHO PLASTY (11)	C-SEC (12)	
NATION	3.8	1.9	1.5	2.0	3.4	4.2	.9	1.2	2.3	2.5	1.9	
NORTHEASTERN REG.	4.4	2.1	1.7	2.5	4.3	4.9	.8	1.4	2.7	3.1	1.1	
PSRC	4.6	2.3	1.5	2.3	5.0	6.6	.5	1.4	2.7	3.2	1.9	
HOSPITALS												
123 PATIENTS AVG PRE-OP	24 3.0	20 1.1	45 1.2	37 2.4	8 7.0	0 0.0	49 1.0	11 2.0	1 4.0	0 0.0	0 0.0	
210 PATIENTS AVG PRE-OP	23 4.1	2 4.0	24 1.5	32 1.8	10 11.4	5 8.4	0 0.0	19 2.9	7 2.3	4 2.0	112 0.9	
234 PATIENTS AVG PRE-OP	7 4.9	2 2.0	16 3.3	1 1.0	7 9.3	6 3.5	0 0.0	67 1.9	5 2.0	2 2.5	0 0.0	
567 PATIENTS AVG PRE-OP	24 2.6	10 1.1	20 1.4	19 1.8	6 7.3	6 8.7	148 0.3	0 0.0	2 2.0	3 3.0	35 0.6	
654 PATIENTS AVG PRE-OP	9 5.4	3 6.0	20 2.6	5 2.4	13 3.3	15 4.9	0 0.0	0 0.0	4 2.3	10 5.1	0 0.0	
765 PATIENTS AVG PRE-OP	10 5.9	3 4.7	41 1.1	20 2.9	32 5.7	8 10.5	2 0.5	73 1.0	4 3.0	8 2.3	24 1.4	
789 PATIENTS AVG PRE-OP	23 9.8	3 5.7	19 1.9	5 4.0	25 8.3	11 5.7	0 0.0	0 0.0	11 2.7	14 3.1	8 0.5	
876 PATIENTS AVG PRE-OP	75 5.3	10 3.3	120 1.2	30 2.8	92 4.1	20 6.7	7 1.4	301 1.2	19 2.2	30 2.4	0 0.0	

\*EXCLUDES PATIENTS GROUPED UNDER "OTHER DIAGNOSIS GROUPS" IN SERIES 3, TABLES 1 AND 2.  
\*\* PROCEDURE READINGS REFER TO THE SAME PROCEDURES DESCRIBED WITHIN SERIES 3, TABLES 1 AND 2.

- CRITERIA and STANDARD - from authoritative statements of ideal performance used in medical care evaluation studies



Thresholds which are pre-defined levels of performance below which some action is deemed mandatory are developed from statements of achievable and acceptable levels of care reflecting the current state of the art.

## EXAMPLE

THE GROUP: All Patients (TYPE) in the PSRO area (UNIVERSE) who underwent a primary C-Section (CHARACTERISTIC) during January-June, 1977 (TIME PERIOD)

SUB-GROUPS: Hospitals listed in order of bed-size

MEASUREMENT: The percentage (UNITS) of variation from the established criteria (ELEMENT)

REFERENCE POINT: An MCE criterion that states that a low cervical approach should *always* be used in a primary C-Section unless the patient has placenta praevia or a concomitant sterilization is performed.

GROUP

REFERENCE POINT

SUB-GROUPS

PSRO AREA-WIDE MCE						
Topic: Elective Primary C-Section -Calendar Year 1977						
Criteria: Low Cervical Approach 100%, Exception: Concomitant Sterilization or Placenta praevia						
HOSPITAL SIZE (BEDS)		% Variations				
BOSP. TOT. #		0	20	40	60 80 100	
LESS THAN 50	11	3				
	8	7				
	13	4				
	14	3	*****			
	20	5				
	21	5	*****			
	26	2	*****			
50-99	2	11				
	10	14				
	12	10				
	17	9				
	18	16				
	24	5	*****			
	25	8				
100-249	27	6				
	4	19				
	5	47				
	9	39				
	19	20	*****			
	22	38	*****			
	30	30	*****			
250+	36	48				
	41	22				
	1	47				
	3	62	**			
	7	51				
	15	48	*****			
	23	39				
	29	44				
	31	57	**			
	38	40				

# EXAMPLE

THE GROUP: Patients (TYPE) in PSRO Area X (UNIVERSE) in selected diagnosis groups (CHARACTERISTIC) during Jan-June, 1977 (TIME PERIOD)

SUB-GROUPS: 18 selected diagnoses listed in diagnosis index code numerical order (not printed)

MEASUREMENTS: (8 different measurements)

COLUMN NUMBER	ELEMENT	UNITS
2	Occurrence of each diagnosis	Total number of patients
3	Days of care used by patients	Total number of days
4	Occurrence of death	Total number of deaths
5	Long stay patients	Total number
6	Studied patients	Total number
7	LOS	Average stay
8	LOS	Coefficient of Variation
9 - 13	LOS	Percentiles

REFERENCE POINTS - Reference points do not necessarily have to be in the same report, i.e., another report may be required.

GROUP	UTILIZATION BY SELECTED DETAILED DIAGNOSIS GROUPS PSRO AREA X JAN-JUNE 1977													SERIES 2 TABLE 1				
SUB-GROUPS	SELECTED DETAILED DIAGNOSIS GROUP (1)	TOTAL NO. OF DISCHARGES (2)	TOTAL DAYS (3)	DEATHS (4)	LONG STAY PTS. 1- (5)	STUDIED PTS. 2- (6)	-----AVERAGE STAY----- AVG. COEFF (7) (8)		PERCENTILE STAY IN DAYS-4 10TH 25TH 50TH 75TH 90TH (9) (10) (11) (12) (13)									
	DIABETES, AGE 35 W/O OP. W/O 2ND DX	154	1983	6	13	135	10.5	0.5	4	7	10	15	27					
	NEUROSES, PERSONALITY DISORDERS	74	1362	0	1	73	17.6	0.7	4	8	16	24	37					
	DYS OF EYE WITH EXTRACTION OF LENS	576	3702	2	23	551	5.8	0.4	4	5	5	7	10					
	ACUTE MYOCARDIAL INFARCTION	588	10068	109	17	462	17.2	0.5	7	10	16	24	33					
	ISCHEMIC HEART DIS. W/O OP. W/O 2ND DX	119	1155	1	8	110	7.8	0.6	3	5	8	10	20					
	CEREB. THROMBO-EMBOL. W/O OP. W/O 2ND DX	101	1030	15	9	77	13.4	0.5	5	7	14	20	40					
	HYPERTROPHY OF T & A	255	432	0	4	251	1.6	0.4	1	1	2	2	2					
	ACUTE UPPER RESP. INF. INFLU. AGE 44	29	295	0	1	20	9.4	0.7	3	4	7	13	24					
	PNEUMONIA, AGE 51	210	1345	3	4	201	5.8	0.5	3	4	5	8	11					
	PNEUMONIA, AGE 50 W/O OP. W/O 2ND DX	42	480	5	2	35	8.8	0.5	3	5	9	13	19					
	GASTRIC & PEPTIC ULCER W/O OP. W/O 2ND DX	35	270	1	1	33	7.1	0.4	3	5	7	9	12					
	HERNIA OF ABD. CAV. AGE 64 W/MINOR REPAIR	252	2471	2	12	238	8.5	0.5	4	6	8	11	17					
	DYS OF GB & BILE DUCT WITH OP. W/O 2ND DX	86	1146	0	6	80	11.9	0.4	7	8	11	16	23					
	DYS. PROSTATE, W/TRANSUR. PROST. W/O 2ND DX	54	621	0	0	54	11.5	0.4	6	9	11	14	16					
	DYS. OF FEM. GEN. ORG. W/HYSTEREC. OTH. MAJ. OP.	244	2106	1	7	236	7.8	0.5	4	5	7	10	14					
	NORMAL DELIVERY, W/O OP. OR W/MINOR OP.	1426	3657	0	19	1407	5.4	0.3	3	3	3	4	5					
	ARTHRITIS W/REPAIR, PLASTIC OP. LAMNECTOMY	43	1565	0	7	36	29.5	0.3	16	25	30	43	69					
	FRAC. OF FEMUR. PELVIS, MULTIPLE W/O OP.	132	3044	5	13	114	21.8	0.7	4	11	21	42	61					
MEASUREMENTS																		
1-LIVE DISCHARGES WITH UNUSUALLY LONG STAYS, WHO WOULD SKEW THE AVERAGE STAY. THE DEFINITION OF A LONG STAY IS DEPENDENT UPON THE PATIENT'S PRINCIPAL DIAGNOSIS. 2-EXCLUDES DEATHS AND LONG STAYS (COLS. 4 AND 5). THESE PATIENTS ARE ALSO EXCLUDED FROM COLS. 7 AND 8. 3-THE STANDARD DEVIATION DIVIDED BY THE AVERAGE STAY 4-EXCLUDES DEATHS ONLY.																		

# WHAT NEW INFORMATION COMES FROM A PSRO PROFILE

## \* DESCRIPTIONS

PSRO profiles provide a description of various dimensions of a patient/provider/institutional group such as:

PROCEDURE (1)	UTILIZATION BY SELECTED PROCEDURES Period JANUARY - JUNE 1977						PSRO 3 SERIES 3 TABLE 1 PAGE 1	
	TOTAL DISCHARGES (2)	TOTAL DAYS (3)	AVG. PRE-OP STAY (4)	DEATHS (5)	LONG STAY PIS-1 (6)	-----AVERAGE STAY----- STUDIED PIS-2 (7)	AVG. STAY (8)	COEFF. VAR-9 (9)
CHOLECYSTECTOMY								
DTS OF PA & BILE DUCT W/O DX2	74	956	3.1	0	5	69	11.4	0.4
DTS OF PA & BILE DUCT W/O DX2 AGE 65	68	814	3.0	8	1	67	11.4	0.4
DTS OF PA & BILE DUCT W/O DX2 AGE 64	101	2124	6.8	7	5	89	18.2	0.4
SUBTOTAL	243	3894	4.6	7	11	225	14.1	0.5
OTHER DIAGNOSIS GROUPS	20	604	11.6	8	3	17	25.2	0.6
TOTAL DIAGNOSIS GROUPS	263	4498	5.1	7	14	242	14.9	0.6
HEMIPROCTECTOMY								
W/PROCTECT	61	484	2.3	0	2	59	7.2	0.5
OTHER DIAGNOSIS GROUPS	5	67	4.6	0	0	5	13.4	0.7
TOTAL DIAGNOSIS GROUPS	66	551	2.4	0	2	64	7.7	0.6
INGUINOFEMORAL HERNIOGRAPHY								
HERNIA OF FOO CAV. AGE 65	112	263	0.8	0	3	109	2.2	0.6
ING. HERNIA 1/PD OBS. 1A-AGE 65W/D DX2	34	202	1.1	0	0	34	5.9	0.3
HERNIA OF FOO CAV. AGE 64	299	3224	1.9	2	11	216	6.3	0.5
SUBTOTAL	375	2694	1.5	2	14	359	6.2	0.7
OTHER DIAGNOSIS GROUPS	53	799	4.5	3	3	47	11.4	0.9
TOTAL DIAGNOSIS GROUPS	428	3493	1.9	5	17	466	6.8	0.8
HYSTERECTOMY								
CA UTERUS-CORPUS W/ABD. HYSTERECT.	43	488	2.1	0	0	43	11.3	0.3
CA HYPUS-CERVIX Ovary W/ABD. NYSTR	11	210	3.4	0	0	11	19.1	0.6
OTW NYSTR. UTERUS-Ovary	19	872	2.3	0	5	74	9.6	0.3
DTS FEMALE GEN. ORGANS	46	490	2.3	0	1	45	10.2	0.3
SUBTOTAL	179	2060	2.3	0	6	173	11.0	0.4
OTHER DIAGNOSIS GROUPS	25	345	3.3	1	2	22	10.4	0.4
TOTAL DIAGNOSIS GROUPS	204	2405	2.4	1	8	195	10.9	0.4
TRANSURETHRAL PROSTATECTOMY								
CA MALE URETHRAL ORGANS	37	825	7.1	1	4	32	17.2	0.5
DTS OF PROSTATE W/O DX2	45	565	3.1	0	0	45	11.2	0.3
DTS OF PROSTATE W/O DX2	125	2052	6.3	3	4	118	15.1	0.5
SUBTOTAL	207	3343	5.8	4	8	195	14.5	0.5
OTHER DIAGNOSIS GROUPS	59	1233	17.9	1	4	34	23.1	0.6
TOTAL DIAGNOSIS GROUPS	246	4616	6.9	5	12	229	14.8	0.6

1-LIVE DISCHARGES WITH UNUSUALLY LONG STAYS, WHO WOULD SKW THE AVERAGE STAY. THE DEFINITION OF A LONG STAY IS  
 2-DEPENDENT UPON THE PATIENT'S PRINCIPAL DIAGNOSIS  
 3-EXCLUDES DEATHS AND LONG STAYS (COLS. 5 AND 6). THESE PATIENTS ARE ALSO EXCLUDED FROM COLS. 8 AND 9.  
 4-THE AVERAGE STAY IS DIVIDED BY THE AVERAGE STAY.

### Column

- (2) How many discharges are in each group
- (3) How many hospital days did each group consume
- (4) What was the average pre-op stay
- (5) How many deaths were there
- (6) How many long stay patients were there
- (7, 8, 9) What was the average time spent in the hospital

### • DIFFERENCES

By displaying equivalent values (same elements and units) for group(s) in conjunction with reference points, differences and similarities become readily apparent.

STAY PROFILE FOR 18 SELECTED DIAGNOSIS GROUPS		NATION, NORTHEASTERN REGION, AND PSRD		JANUARY - JUNE 1977		KEY: NATION REGION PSRD (25TH TO 75TH PERCENTILE, FIRST AND LAST + MARK END POINTS, LETTER MARKS MEDIAN)	
SELECTED DETAILED DIAGNOSIS GROUP (1)	*ALL TITLES- TOTAL PATIENTS-1 (2)	DAYS STAY-2		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 >25			
DIS OF GR & BILE DUCT WITH OP, W/O ZND DX	4846 NATION 1563 REGION 86 PSRD			-----N----- -----R----- -----P-----			
DIS PROSTATE, W/TRANSUR PROST, W/O ZND DX	4674 NATION 1304 REGION 54 PSRD			+---N---+ +---R---+ +---P---+			
DIS OF FEM GEN ORG W/HYSTERC, OTH MAJ OP	7770 NATION 2708 REGION 243 PSRD			-----N----- -----R----- -----P-----			
NORMAL DELIVERY, W/O OP OR W/MINOR OP	29784 NATION 9696 REGION 1626 PSRD			+---N---+ +---R---+ +---P---+			
ARTHRITIS W/REPAIR, PLASTIC OP, LAMPECTOMY	4327 NATION 1046 REGION 43 PSRD			-----N----- -----R----- -----P-----			
FRACTURE OF FEMUR, PELVIS, MULTIPLE W/O OP	5316 NATION 1469 REGION 127 PSRD			+---N---+ +---R---+ +---P---+			

1-EXCLUDES DEATHS.  
2-EXCLUDES DEATHS. IF 75TH PERCENTILE EXCEEDS 25 DAYS, IT WILL BE SHOWN AS >25 DAYS.

**FOR EXAMPLE:**

- For Disease of GB and Bile Duct the median stay for the PSRO is 11 days, while that for the region and nation is 10 days.

## WHEN IS A DIFFERENCE MEANINGFUL?

There are many sophisticated statistical methods for testing the hypothesis that different values represent a real difference. But for practical purposes a difference is meaningful, i.e., leads to further activity, when it is *big* or *repeated*.

### \* BIG

Two values are clearly separated by a large difference.

### EXAMPLES:

Hospitals #14 and #21 clearly have a higher % of variations than the less than 50 bed size group. For hospital #21 the 100% variation rate represents 5 cases, all of which did not comply with the criterion.

The 250+ bed size group clearly has fewer significant variations than the 100-249 bed size group.

PSRO AREA-WIDE MCE			
Topic: Elective Primary C-Section -Calendar Year 1977			
Criteria: Low Cervical Approach 100%, Exception: Concomitant Sterilization or Placenta praevia			
HOSPITAL SIZE (BEDS)	HOSP. TOT. #	PTS. 0	% Variations
LESS THAN 50	11	3	+
	8	7	+
	13	4	+
	14	3	*****
	20	5	*****
	21	5	*****
50- 99	26	2	+
	2	11	+
	10	14	+
	12	10	+
	17	9	+
	18	16	+
	24	5	*****
	25	8	+
100- 249	27	6	+
	4	19	+
	5	47	+
	9	39	+
	19	20	*****
	22	38	*****
	30	30	*****
250+	36	48	+
	41	22	+
	1	47	+
	3	62	**
	7	51	+
	15	48	*****
	23	39	+
	29	44	+
	31	57	**
	38	40	+

Multiple measurements all show a difference *in the same direction*.

EXAMPLE: For diseases of prostate

- 27

## EXPLAINING DIFFERENCES

Where meaningful differences exist, they may sometimes be explained by obtaining rearranged or additional data such as

### SUB-SETS

Dividing a measurement into its component measurements, e.g., dividing length of stay into pre-op and post-op stay may often help to focus in on the reason for a difference.

UTILIZATION BY SELECTED PROCEDURES									
Paso 5									
JANUARY - JUNE 1977									
PROCEDURE (1)	TOTAL DISCHARGES (2)	TOTAL DAYS (3)	AVG. PRE-OP STAY (4)	DEATHS (5)	LONG STAY PTS. -1 (6)	PSRO 3 SERIES 3 TABLE 1 PAGE 1			
						-----AVERAGE STAY----- STUDIED PTS. -2 (7)			
						STAY VAR. -1 (8)	COEF. (9)		
CHOLECYSTECTOMY									
DTS OF CB & BILE DUCT W/O DX2	74	956	3.1	0	5	69	11.4	0.4	
DTS OF CB & BILE DUCT W/OX2, AGE 65	68	814	3.0	0	1	67	11.4	0.4	
DTS OF CB & BILE DUCT W/OX2, AGE 64	101	2124	6.8	7	5	89	18.2	0.4	
SUBTOTAL	243	3894	4.6	7	11	225	14.1	0.5	
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HEMORRHOIDECTOMY									
HEMORRHOIDS	61	464	2.3	0	2	59	7.2	0.5	
OTHER DIAGNOSIS GROUPS	5	67	4.6	0	0	5	13.4	0.7	
TOTAL DIAGNOSIS GROUPS	66	531	2.4	0	2	64	7.7	0.6	
INGUINOFOCHORAL HERNIOGRAPHY									
HERNIA OF ABD. CAV. AGE 65	112	265	0.8	0	3	109	2.2	0.6	
ING. HERNIA W/O DRS. 14-AGE 65 W/O DX2	36	202	1.1	0	0	34	5.9	0.1	
HERNIA OF ABD. CAV. AGE 64	229	2324	1.9	2	11	216	6.3	0.5	
SUBTOTAL	375	2694	1.5	2	14	359	6.2	0.7	
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CA UTERUS-CERVIX OVARY W/ABD. HYSTER.	11	210	3.4	0	0	11	19.1	0.6	
BN MEPL. UTERUS, OVARY	79	872	2.3	0	5	74	9.9	0.3	
DTS FEMALE GEN. ORGANS	46	490	2.3	0	1	45	10.2	0.3	
SUBTOTAL	179	2060	2.3	0	6	173	11.0	0.4	
OTHER DIAGNOSIS GROUPS	25	345	3.3	1	2	22	10.4	0.6	
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TRANSURETHRAL PROSTATECTOMY									
CA PROSTATE W/O DX2	37	825	7.1	1	4	32	17.2	0.5	
DTS OF PROSTATE W/O DX2	45	506	3.1	0	0	45	11.2	0.3	
DTS OF PROSTATE W/OX2	125	2052	4.3	3	4	118	15.1	0.5	
SUBTOTAL	207	3383	5.8	4	8	195	14.5	0.5	
OTHER DIAGNOSIS GROUPS	39	1233	12.9	1	6	34	23.1	0.6	
TOTAL DIAGNOSIS GROUPS	246	4616	6.9	5	12	229	14.8	0.6	

1- LIFE DISCHARGES WITH UNUSUALLY LONG STAYS, WHICH WOULD SKEW THE AVERAGE STAY, THE DEFINITION OF A LONG STAY IS  
 - DEPENDENT UPON THE PATIENT'S PRINCIPAL DIAGNOSIS  
 2- COLLECTS DEATHS AND LONG STAYS (COLS. 5 AND 6). THESE PATIENTS ARE ALSO EXCLUDED FROM COLS. 8 AND 9.  
 3- THE STAY-SD DIVISION DIVIDED BY THE AVERAGE STAY.

1-LIVE DISCHARGES WITH UNUSUALLY LONG STAYS, WHO WOULD SKEW THE AVERAGE STAY. THE DEFINITION OF A LONG STAY IS DIFFERENT UPON THE PATIENT'S PRINCIPAL DIAGNOSIS

2-EXCLUDES DEATHS AND LONG STAYS (COLS. 5 AND 6). THESE PATIENTS ARE ALSO EXCLUDED FROM COLS. 8 AND 9.

3-THE STANDARD DEVIATION DIVIDED BY THE AVERAGE STAY.

For the procedure transurethral prostatectomy the difference in average stay between cancer patients (17.2) and those with diseases of prostate (11.2) is almost totally due to a difference in pre-op stay.



## CLUSTERS

Some differences may be due to just a few patients/providers/institutions in the group. Rearranging the data into different SUB-GROUPINGS (for example by hospital) may clarify the differences or help rule out certain factors.

AVERAGE PRE-OP STAY* FOR SELECTED PROCEDURES HOSPITAL DATA JANUARY 1977 - JUNE 1977											PSRC 3	
PROCEDURE**											SERIES 3	
											TABLE 4	
											PAGE 1	
AREA (1)	CHOLE (2)	HEMOR (3)	INGUINO HERN (4)	HYST (5)	TRANS PROST (6)	SUPRA PROST (7)	T & A (8)	INTRA LENS EXTR (9)	RAD PLASTIC (10)	ARTHRD PLASTY (11)	C-SEC (12)	
NATION	3.8	1.9	1.5	2.0	3.4	4.2	.9	1.2	2.5	2.5	.9	
NORTHEASTERN REG	4.4	2.1	1.7	2.5	4.3	4.9	.8	1.4	2.7	3.1	1.1	
PSRO	4.6	2.3	1.5	2.3	5.8	6.6	.5	1.4	2.7	3.2	.9	
HOSPITALS												
123 PATIENTS AVG PRE-OP	24 3.0	28 1.1	45 1.2	37 2.4	8 7.0	0 0.0	49 1.8	11 2.0	1 4.0	0 0.0	8 0.0	
210 PATIENTS AVG PRE-OP	23 4.1	2 4.0	24 1.5	32 1.8	10 11.4	5 8.4	0 0.0	19 2.9	7 2.3	4 2.0	112 0.9	
234 PATIENTS AVG PRE-OP	7 4.9	2 2.0	16 3.3	1 1.0	7 9.3	6 3.5	0 0.0	67 1.9	5 2.8	2 2.5	0 0.0	
567 PATIENTS AVG PRE-OP	24 2.6	18 1.1	20 1.4	19 1.8	6 7.3	148 0.3	0 0.0	0 0.0	2 2.0	2 3.0	35 0.6	
654 PATIENTS AVG PRE-OP	9 5.4	3 6.0	28 2.6	5 2.4	13 3.3	15 4.9	0 0.0	8 0.8	4 2.3	18 5.1	0 0.0	
765 PATIENTS AVG PRE-OP	18 5.9	3 4.7	41 1.1	20 2.9	32 5.7	8 10.5	2 0.5	73 1.0	4 3.0	8 2.3	24 1.4	
789 PATIENTS AVG PRE-OP	23 1.8	3 5.7	19 1.9	3 4.0	25 8.3	11 5.7	0 0.0	8 0.0	11 2.7	14 3.1	8 0.3	
875 PATIENTS AVG PRE-OP	75 3.3	10 3.3	120 1.2	30 2.8	92 4.1	28 6.7	7 1.4	301 1.2	19 2.2	30 2.4	0 0.0	

\*EXCLUDES PATIENTS GROUPED UNDER "OTHER DIAGNOSIS GROUPS" IN SERIES 3, TABLES 1 AND 2  
\*\* PROCEDURE HEADINGS REFER TO THE SAME PROCEDURES DESCRIBED WITHIN SERIES 3, TABLES 1 AND 2.

For cholecystectomy hospital #789 had an average pre-op stay of 9.8 days, more than twice the average for the PSRO.

## ADDITIONAL INFORMATION

Very often the real cause of a difference cannot be determined from the data alone. Then additional explanatory information must be obtained from the source of service. In the PSRO case this means shifting the burden of explaining the differences to the individual hospitals since only there can external influences (e.g., lack of long term care beds) or other modifying factors (e.g., x-ray machine out of order) be elucidated. Specific critical events occur (e.g., epidemics, floods or other disasters) that influence the pattern displayed; change in hospital staffing patterns or practice patterns of individual physicians can affect the data. Seasonal variations in the population served by hospitals (e.g., migrant workers in agricultural communities, vacationers in resort areas) and introduction of new medical technology may be additional information that helps to explain differences.

## RESULTS OF PSRO PROFILE ANALYSIS

As a result of analyzing a profile, and the additional profiles and information developed as a result of the preliminary analysis, the PSRO may determine one or more findings. Examples are:

- Performance across the PSRO area is uniform and acceptable.
- Performance in one or more hospitals indicates a likely problem area.
- The problem does (or does not) seem to relate to individual practitioners.
- The problem seems to be of such a nature that bringing it to the attention of the hospitals or practitioners should suffice to correct it.
- Further in-depth study (MCE) is needed to identify cause and attribution of problems.
- Immediate corrective action must be instituted to prevent further problems.

From these findings, there will flow recommendations for action - but these must take into account the level of confidence in the data.

There has been much unease about taking action based on PSRO profile data because of suspicions concerning such data. In order to estimate the credibility of the data (and thereby be confident in taking action), two aspects must be examined -- the validity and the reliability.

## • VALIDITY

Validity has to do with whether the data presented really *measures the characteristic* purportedly being investigated (or in other words - what is really being measured?). For example, counting the number of patients receiving Medicare benefits describes the *size of the group*, but says nothing about the appropriateness of the care.

For example, one cannot directly measure savings in hospital bed-days (since you cannot count patients who were not there), but that savings can be inferred by combining two measures to give the difference in pre-op stays during two different time periods for an elective procedure. If the pre-op stay was reduced by 1.5 days and there are 30 patients in the group in the current time period, the impact is a savings of 45 hospital bed-days ( $30 \times 1.5$ ) for the current period.

The validity of such an inference depends both on the validity of the individual measures and the validity of the logic used to draw the inference. Care should be taken to avoid the tendency seen in many instances of reaching conclusions that are beyond that which *validly* can be inferred from the data presented.

For example, just because the mortality rate for MIs in an area increases after the installation of an emergency medical system mobile intensive care vehicle does not mean that such patients are receiving poorer care because they are being treated by technicians. It often means that the rescue service has been able to bring a significant number of patients who would have died outside the hospital into the hospital and only some of them survived.

## • RELIABILITY

Reliability of data has to do with whether the same measurement gathered by different observers is *repeatable*, and whether the processing of such data repeatedly gives the same results. Data quality control techniques, such as reabstracting a sample of records, make it possible to quantify the reliability of data and assist in improving it. For example, counting days of stay is usually a very reliable measurement, whereas less confidence exists in the reliability of assigning 4-digit diagnosis codes (and even less in choosing the "principal procedure").

The reliability of computerized data is also a concern. While it is true that a computer does not make mistakes (well, almost never) the people who abstract and enter data and program and operate computers are just as fallible as anyone else. Before placing heavy confidence in such data, adequate and effective quality control procedures should be in place and functioning. Such controls should include periodic reabstracting (and also recording), verification of correct entry ("twice told true"), checks on completeness and internal consistency, periodic re-testing of programs, and cross-checks between reports allegedly using the same input. Information about data quality control procedures and their effectiveness should be available to the user so that accurate estimates can be made of the reliability of the data.

## CREDIBILITY LEVEL vs. "ACTION"

Part of analyzing a finding is to estimate the credibility level of the data, considering both the reliability of the measurements and the validity of the measures and inferences.

But even where the credibility level is relatively low, the profile can be useful. As long as the predetermined credibility level is accounted for, the results of analysis are valid and can be used as a basis for "action." An estimate should be made of the credibility level of the data and the type of action matched to it. For example:

Credibility Level of Data	Examples of Appropriate Types of Action
HIGH	<ul style="list-style-type: none"><li>• Focus out of 100% concurrent review</li><li>• Withdraw delegated status</li></ul>
MEDIUM	<ul style="list-style-type: none"><li>• Require explanations from hospital or practitioners</li><li>• Indicate MCE Study to determine exact cause of problem</li></ul>
LOW	<ul style="list-style-type: none"><li>• Request other measurements to help confirm findings*</li><li>• Observe performance over an additional time period</li></ul>

*\*Where several measurements all seem to point to the same finding or raise the same question, the validity of such a finding or question is much higher than if it were based on the analysis of only one measurement.*

## ACTION AND FOLLOW-UP

After findings have been identified and categorized, some type of action must be designated, as well as a mechanism for assuring that the action has been (or is being) completed. When PSRO Board members do not constitute an action group *per se*, all actions must be implemented and conducted through appropriate hospital channels. Even here, however, the PSRO retains responsibility for establishing objectives, suggesting actions, and conducting follow-up activity to assure that action has been taken and objectives achieved.

In that the purpose of profile analysis is to identify correctable problems or suggest areas where care can be made even better, effective action is critical to the entire process. Effective action requires:

- ESTABLISHING OBJECTIVES

Specific organizational (PSRO) objectives be defined and stated in measurable terms. For example, reducing the pre-op length of stay for elective surgical procedures to less than or equal to 2 days, or the use of whole blood for transfusion only to those patients where immediate volume correction is necessary.

- TRANSMITTING RECOMMENDATIONS

Corrective action recommendations are directed through appropriate channels to the medical staff, administrative and board officials possessing requisite authority and responsibility to implement corrective measures in each hospital.

- TIMETABLE FOR FOLLOW-UP

Time periods for action to be accomplished are established, reflecting the immediacy of the problems identified in terms of demonstrated consequence to desirable patient outcomes.

- DEMONSTRATING IMPACT

Comparative profiles showing changes in the values of appropriate measurements are used to demonstrate the effectiveness of the PSRO review system. For example, where a PSRO has addressed the issue of pre-op stay, as a result of profile analysis, a profile of a subsequent time period showing the differences serves to quantify the effect on pre-op stay. Thus, the impact of review on reducing such stay can be evaluated.

Follow-up plans are specified to determine and record the effectiveness of all actions recommended, especially in respect to achieving the stated objectives. For example, it was determined through profile analysis that all of the hospitals in the PSRO Area had achieved an average length of stay for AMI patients that was 1 day lower than the regional norm. While the PSRO board members felt this was certainly acceptable, and said so in the congratulatory report sent to the hospitals, they also felt that some of the more recently published information on selecting AMI patients for early discharge was directly applicable to the practices and patient populations in their hospitals. Therefore they took the action of recommending that this information be disseminated to the hospital medical staff and set an objective of reducing the average stay of AMI patients by at least 1 more day over the next 6 months.

## MONITORING PROGRESS

Once action has been initiated, some plan must be established for monitoring as a mechanism for follow-up, i.e., re-profiling and reanalysis to determine the effectiveness of action, and periodic profile analysis to be sure that slippage does not occur. The monitoring must detail:

1. Specifications for profiles to be generated (GROUP, SUB-GROUPS, MEASUREMENTS, REFERENCE POINTS).

These may be the same as the original or some modification suggested by the analysis.

2. A schedule for producing the profile that allows for the action to have had an effect.

## AN EXAMPLE

The following example of the complete process is taken from PSRO Transmittal No. 61, dated January 23, 1978, on PSRO Profile Analysis.

A PSRO is interested in examining the length of stay pattern in each of the hospitals in the PSRO area for 15 selected diagnosis groups, chosen from the leading causes of admission in the area. The purpose is to determine whether the patterns are consistent across hospitals or any marked differences exist. A previous study had indicated that readmission rates for these diagnoses did not vary among the hospitals. A quarterly profile report is designed, displaying for the area as a whole and for each hospital the total number of patients in each of the selected diagnosis groups, their total stay and the average stay for all live discharges (Table 1).

ATTACHMENT 1		THIS REPORT IS PREPARED FOR THE PSRO AREA AND EACH HOSPITAL				TABLE 1			
		UTILIZATION BY SELECTED DIAGNOSIS GROUP							
		PSRO AREA & January-March 1977							
SELECTED DIAGNOSIS GROUP (1)	TOTAL PATIENTS (2)	TOTAL DAYS (3)	DEATHS (4)	AVERAGE STAY * (5)	---Percentile Stay in Days---				
					25th (6)	50th (7)	75th (8)		
Diabetes of age > 35 without secondary dx or with minor secondary dx	100	530	0	5.3	1	5	7		
Neuroses (Obsessive-compulsive-depressive)	75	729	0	9.7	4	6	10		
Diseases of the eye with extraction of lens	95	291	0	3.0	3	3	3		
Acute Myocardial infarction	73	816	15	12.0	1	11	14		
Ischemic Heart disease, without operation, without secondary diagnoses	80	420	2	5.1	3	4	7		
Hypertrophy of T & A	98	215	0	2.2	2	2	2		
Acute upper respiratory infection & Influenza of age > 44	44	510	0	11.6	5	7	11		
Pneumonia of age > 30 without secondary diagnoses & without operation	52	555	1	10.7	6	8	10		
Gastric & peptic ulcer without operation & without secondary dx	10	63	0	6.3	3	4	12		
Abdominal hernia of age > 64 with minor repair operation	65	442	0	6.8	5	6	8		
Disease of gall bladder & bile duct with operation without secondary dx	88	897	0	10.2	6	9	12		
Disease of prostate with transurethral prostatectomy without secondary dx	75	555	0	7.4	5	6	8		
Disease of female genital organs with hysterectomy repair, major operation	160	1408	0	8.8	6	7	9		
Normal delivery, without operation or with minor operation assisting delivery	329	1046	0	3.3	2	2	3		
Fracture of femur, pelvis, multiple without operation	32	425	0	13.3	4	8	15		

\* Excludes deaths

\* Excludes deaths

Also shown are the 25th, 50th, and 75th percentile stays.



The latter percentile data are then graphically displayed in a second profile for each selected diagnosis group (Table 2). It is decided in advance that attention will be drawn to hospitals with a 50th percentile stay the same or higher than the 75th percentile stay for the area.

TABLE 2

THIS REPORT WILL BE PRODUCED FOR EACH DIAGNOSIS GROUP

STAY PROFILE FOR SELECTED DIAGNOSES  
PSRD X AND HOSPITAL DATA  
January - March 1977

Dis. case of female genital organs with hysterectomy,  
major operation

STAY LETTER	TOTAL PATIENTS (?)	DAYS STAY*																				
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
PSRD	160																					
HOSPITAL	15																					
PSRD	25																					
HOSPITAL	18																					
PSRD	23																					
HOSPITAL	10																					
PSRD	14																					
HOSPITAL	20																					
PSRD	26																					

\*Includes deaths. If the 75th percentile exceeds 20 days,  
it will go off the scale.

KEY  
PSRD = +---P---+  
HOSPITAL = +---A---+  
\* = 25th and 75th percentile  
end points  
LETTER = 50th percentile (median)

The reports are analyzed, and two hospitals are found to exceed the screening criteria for five of the studied diagnosis groups. Since each of the groups represents operated patients, it is decided at this time to examine the pre-operative stay patterns of each hospital in the area for these five groups to see if this might help explain the overall longer length of stay patterns in the two designated hospitals.

A third report format is designed, displaying for the area as a whole and for each hospital the total number of patients in each of the five groups and their average pre-op stays (Table 3).

TABLE 3		
THIS REPORT IS PREPARED FOR THE PSRO AREA AND EACH HOSPITAL		
AVERAGE PRE-OP STAY SELECTED DIAGNOSIS GROUPS PSRO AREA X January-March 1977		
SELECTED DIAGNOSIS GROUP (1)	TOTAL PATIENTS (2)	AVERAGE PRE-OP STAY (3)
Hypertrophy of T & A	98	.9
Abdominal hernia of age > 64 with minor repair op	65	1.4
Disease of gall bladder and bile duct with operation without secondary dx	88	2.2
Disease of prostate with trans- urethral prostatectomy without secondary dx	75	1.6
Disease of female genital organs with hysterectomy, repair, major operation	160	1.2

Again, the data also are graphically displayed for each of the five target diagnosis groups (Table 4).

TABLE 4																	
THIS REPORT IS PRODUCED FOR EACH OF THE FIVE TARGET DIAGNOSIS GROUPS																	
AVERAGE PRE-OP STAY SELECTED DIAGNOSIS GROUPS ALL HOSPITALS, PSRO X January - March 1977																	
Disease of female genital organs with hysterectomy, repair, major operation																	
Average Pre-Op Stay*																	
HOSPITAL (1)	TOTAL PATIENTS (2)	< 1 DAY (3)	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8+ Days
HOSPITAL A	15	A															
HOSPITAL B	25					P											
HOSPITAL C	18		r														
HOSPITAL D	23	D															
HOSPITAL E	19		r														
HOSPITAL F	14			F													
HOSPITAL G	20				G												
HOSPITAL H	26		H														

Rounded to the nearest half day for patients with pre-op stays of 1 day or greater.

Rounded to the nearest half day for patients with pre-op stays of 1 day or greater.

This follow-up analysis indicates that average pre-op stay is consistently longer in both of the indicated hospitals for each of the five groups studied. This difference accounts for much of the overall difference in length of stay seen for these hospitals in the first two sets of reports.

Before pursuing this finding directly with the hospitals involved, the PSRO considers whether first to examine the pre-op stay patterns of the individual physicians in these two hospitals who treat the five groups of patients in question. It is decided that, whereas this might provide additional useful information about whether the longer stay patterns are institution-wide or can be attributed to individual practitioners, there are only sufficient data to examine this question for one of the diagnosis groups (i.e., disease of female genital organs with hysterectomy, repair, major operation). A profile is prepared for each of the two hospitals, displaying the average pre-op stay patterns for the physicians who treat patients in this diagnosis group (Table 5). The data indicate that, at least for this group of patients, the longer stay pattern is institution-wide.

TABLE 5

THIS REPORT IS PRODUCED FOR ALL PHYSICIANS TREATING PATIENTS  
WITH THIS PRINCIPAL DIAGNOSIS IN HOSPITALS B AND G

AVERAGE PRE-OP STAY  
SELECTED PHYSICIANS  
HOSPITAL B  
January - March 1977

Average Pre-Op Stay*																		
PHYSICIAN (1)	TOTAL PATIENTS (2)	<1 Day (3)	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8+ Days	
326	8					X												
328	5					X												
335	5				X													
337	7					X												

\*Rounded to the nearest half day for patients with pre-op stays of 1 day or greater.

The PSRO then checks with all the hospitals and learns that the two affected hospitals do considerably less pre-op testing on an out-patient basis than the other hospitals. An educational session is planned for the physicians from the two target hospitals who perform the procedures under study and for relevant administrative personnel. Physicians with similar specialties are invited from other hospitals to discuss the policies they follow for out-patient testing. It is agreed by the participants from the target hospitals to adopt similar policies to shorten pre-op stay.

A follow-up study is conducted after the new policies have been in effect for three months. The graphic display of pre-op stay for each of the five target diagnosis groups is repeated for the new time period (Table 6) to examine changes in the two target hospitals and to monitor continuing patterns in the other hospitals.

TABLE 6

THIS REPORT IS PRODUCED FOR EACH OF THE FIVE TARGET DIAGNOSIS GROUPS

AVERAGE PRE-OP STAY  
SELECTED DIAGNOSIS GROUPS  
ALL HOSPITALS, PSRO X  
July - September 1977

Disease of female genital organs with hysterectomy,  
repair, major operation

		Average Pre-Op Stay*															
HOSPITAL (1)	TOTAL PATIENTS (2)	< 1 Day (3)	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8+ Days
HOSPITAL A	13	A															
HOSPITAL B	26			B													
HOSPITAL C	19		C														
HOSPITAL D	24	D															
HOSPITAL E	18		E														
HOSPITAL F	13			F													
HOSPITAL G	17			G													
HOSPITAL H	22		H														

\*Rounded to the nearest half day for patients with pre-op stays of 1 day or greater.

A final profile (Table 7) documents by hospital the changes in pre-op stay between the two quarters studied.

TABLE 7

THIS REPORT IS PRODUCED FOR EACH HOSPITAL IN THE PSRO AREA

AVERAGE PRE-OP STAY  
SELECTED DIAGNOSIS GROUPS  
HOSPITAL B, PSRO X  
July-September 1977

SELECTED DIAGNOSIS GROUP (1)	---First Quarter---		---This Quarter---		DIFFERENCE IN PRE-OP STAY
	TOTAL PATIENTS	AVERAGE PRE-OP STAY	TOTAL PATIENTS	AVERAGE PRE-OP STAY	
Hypertrophy of T & A	12	1.5	13	1.0	-.5
Abdominal hernia of age > 64 with minor repair op	8	2.8	10	1.9	-.9
Disease of gall bladder and bile duct with operation without secondary dx	10	3.7	12	2.6	-1.1
Disease of prostate with transurethral prostatectomy without secondary dx	9	2.6	11	1.8	-.8
Disease of female genital organs with hysterectomy, repair, major operation	25	2.6	26	1.6	-1.0



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